

**ORTHOPHOTOSCOPE** - An instrument for converting conventional perspective photographs into orthophotographs by differential rectification. It features a double-projection anaglyphic instrument and a movable exposing slit that is used to scan the ground surface of the projected stereomodel in a systematic pattern. It records the orthographically corrected imagery of the blue-filtered diapositive on film insensitive to red light.

**OUTER CONTINENTAL SHELF** - Under Public Law 212 (the Outer Continental Shelf Lands Act) it is that portion of the continental shelf which lies seaward of state boundaries as defined in Public Law 31 (the Submerged Lands Act).

**OVERLAP** - The amount by which one photograph duplicates the area covered by another photograph, usually expressed as a percentage.

**OVERLAY** - 1) A drawing on a transparent medium to be superimposed on another drawing. 2) A transparent medium on which flight lines and/or area to be photographed are plotted to be superimposed on a map, thus avoiding defacing the map.

**OVERSHEET** - A transparency or a print of a map compilation used for recording supplemental information.

**OXBOW** - A crescent-shaped lake formed in an abandoned river bend which has become separated from the main stream by a change in the course of the river.

## P

**PADS** - Position azimuth determination system.

**PI** - Photo Interpretation.

**PUG** - Punkt Übertragungs Geräte. See POINT MARKING AND TRANSFERRING DEVICE.

**PZS** - Pole-Zenith-Star or Pole-Zenith-Sun.

**PANCHROMATIC** - Photographic emulsion sensitive to all colors of light.

**PANEL** - An element of a target used for ground control or point identification during aerial photography.

**PANELING** - Marking points on the ground with material of suitable contrast, size, and shape to provide images which can be positively identified on aerial photographs.

**PANEL POINT** - A photo image of a paneled point.

**PANTOGRAPH** - A precision mechanical instrument for reproducing at some desired scale, generally at a reduction, details from stereomodels, photographs, maps, drawings, etc.

**PARALLACTIC ANGLE** - See ANGULAR PARALLAX.

**PARALLAX** - The apparent displacement of the position of an object with respect to a reference point or system caused by a shift in the point of observation. See ABSOLUTE STEREOSCOPIC PARALLAX, X PARALLAX AND Y PARALLAX.

**PARALLAX BAR** - See STEREOMETER.

**PARALLAX DIFFERENCE** - The difference in the absolute parallaxes of two points imaged on a pair of photographs. Customarily used in the determination of the difference in elevations of the objects.

**PARALLEL** - 1) The relationship between two lines in the same plane which will not meet if extended. 2) A line on the earth (or a map) having the same latitude at every point.

**PARALLELOGRAM OF ZEISS** - See ZEISS PARALLELOGRAM.

**PARALLEL PLATE** - See PLANE PARALLEL PLATE.

**PASS** - A low and passable gap through a mountain barrier.

**PASSIVE SYSTEM** - A sensing system that detects or measures radiation emitted by the target.

**PASS POINT** - A point selected on imagery of the same object or point on the ground appearing on three or more photographs, used to relate adjacent stereomodels, or strips horizontally (and usually also vertically) in aerotriangulation; also, the corresponding point on the base sheet used to provide a basis for stereomodel positioning and orientation in map compilation. Pass points are usually chosen at classical points. See CLASSICAL POINT and TIE POINT.

**PATTERN** - 1) In a photo image, the regularity and characteristic placement of tones or textures. 2) The relations between any more-or-less independent parameters of a response; e.g., the pattern in the frequency domain of the response from an object.

**PEAK** - A top of a mountain or hill, standing above the level of the range or the surrounding country.

**PEDIMENT** - In arid and semi-arid regions, the gently sloping plain strewn with boulders that borders the mountains.

**PEELCOAT** - A transparent plastic material with an opaque coating which can be cut and peeled to prepare open windows for printing masks.

**PEG TEST** - A method of adjustment of a leveling instrument.

**PENCIL OF LIGHT** - A ray of light.

**PENINSULA** - A stretch of land almost surrounded by water.

**PENTA PRISM** - A five sided prism with angles such that any entering ray is reflected at 90°. See RIGHT ANGLE PRISM.

**PEN-TYPE GRAVER** - A pin vise with an angled head used in scribing.

**PERMANENT MARK** - A readily identifiable, relatively permanent, recoverable mark which designates precisely the location of a survey point.

**PERSONAL ERROR** - An error caused by an observer's personal habits, mental or physical reactions, or inability to perceive dimensional values exactly. It may be accidental or systematic. A systematic personal error is termed a "*personal equation*."

**PERSPECTIVE CENTER** - The point of origin or termination of bundles of perspective rays.

**PERSPECTIVE PHOTOGRAPH** - A photograph taken with any apparatus in which all object rays pass through a single point and all image rays also pass through a single point.

**PERSPECTIVE PROJECTION** - The projection of points by straight lines through a given point to an intersection with the plane of projection. Unless otherwise indicated, the point of projection is understood to be at a finite distance from the plane of projection.

**PERSPECTIVE RAY** - A straight line from a ground object through the lens to the image on the photograph.

**P-FACTOR** - Any of the considerations such as atmospheric and terrain conditions, photographic system capabilities, and photogrammetric system capabilities which influence the determination of a maximum flight height for photography consistent with a given requirement for compilation of planimetry. Generally used in a collective sense and referred to as "*the P-factor*" to denote the combined effect of these considerations.

**PHILADELPHIA ROD** - A sliding two piece leveling rod with a target.

**PHOTOALIDADE** - A photogrammetric instrument having a telescopic alidade, a plateholder, and a hinged ruling arm, all mounted on a supporting frame. It is used for plotting lines of direction and measuring vertical angles to selected features on oblique and terrestrial photographs.

**PHOTO BASE** - Distance between principal points of adjacent aerial photos, usually measured on one photograph after conjugate principal points are transferred.

**PHOTOCLINOMETRY** - Determination of slopes from study of brightness in one photographic image.

**PHOTOCONTROL DIAGRAM** - See PHOTOCONTROL INDEX MAP.

**PHOTOCONTROL INDEX MAP (USGS)** - A map showing the location and identifying data of the centers of the aerial photographs, the existing basic and supplemental control, the planned basic and supplemental control, and the quadrangle and (or) project boundaries. Sometimes an outline of the area covered by each aerial photograph is shown.

**PHOTOCONTROL POINT** - Any station in a horizontal and (or) vertical control system that is identified on a photograph and used for correlating the data shown on the photograph.

**PHOTODELINEATION** - The delineation of features on a photograph, usually with colored pencil.

**PHOTOGRAMMETRIC CONTROL** - Basic surveys established by photographic methods, used to position lower order surveys, mapping or photogrammetric surveys.

**PHOTOGRAMMETRIC ELEVATION (USGS)** - An elevation established by photogrammetric means. See T-ELEVATION.

**PHOTOGRAMMETRIC SYSTEM** - A combination of instruments, facilities, and procedures used in producing maps and surveys by photographic analysis including cameras, printers, photographic materials, plotting instruments, control pattern, and personnel.

**PHOTOGRAMMETRY** - The science or art of obtaining reliable measurements by means of photographs.

**PHOTOGRAPH** - A general term for a positive or negative picture made with a camera on sensitized material, or prints made from a camera original.

**PHOTOGRAPHIC MAP** - 1) A photographic copy of an assembly of individual aerial photographs which are arranged along the flight line in their proper relative positions. 2) An overlay containing the delineated boundary of each photograph, keyed to a base map, and depicting the location and area of coverage of each photograph and/or flight strips of photographs.

**PHOTOGRAPH PERPENDICULAR** - The perpendicular from the interior perspective center to the plane of a photograph.

**PHOTOGRAPH PYRAMID** - A surface formed by three image points on a photograph as a base and the apex of a pyramid at the perspective center.

**PHOTOGRAPH SCALE** - The ratio of the distance between two points on a truly vertical photograph, having no appreciable relief, and corresponding distance on the ground. If the photograph is tilted or if the terrain has appreciable relief, the photograph scale is not uniform. The nominal scale of vertical photographs is generally taken as the ratio between the focal length of the aerial camera and the flight height above mean ground. The scale of oblique photographs varies continuously in the direction of tilt, so that the term "*photograph scale*" represents an approximation only.

**PHOTOGRAPHY** - The art or process of producing images on sensitized material by the action of light. The proper term for the product in this process is photograph or photographs.

**PHOTOGRAPHY INDEX MAP** - A map of showing the location and numbers of the flight strips and photographs.

**PHOTOIDENTIFICATION** - The process of 1) showing the photographic location of ground points in relation to surrounding image detail, and 2) identifying, on the ground, points marked and described on the photographs. See PINPOINTING.

**PHOTOIMAGE MAP** - See PHOTOMAP.

**PHOTOINDEX** - An uncontrolled mosaic of photographs in shingle overlay, rephotographed at a reduced scale. It is generally used as a source of information for details of available photographic coverage.

**PHOTOINTERPRETATION** - The examination of photographic images for the purposes of identifying objects, determining their nature, describing them, and evaluating their significance.

**PHOTOMAP** - A map prepared on a base containing photoimagery which is retained as a part of the representation. It may incorporate special cartographic treatment, photographic line enhancement, color separation, or a combination of these. See ORTHOPHOTOMAP.

**PHOTOMECHANICAL ETCHING** - A process in which positive film copy is exposed by arc light onto sensitized paint-coated plastic. The paint is hardened where the light strikes and is unaffected in the unexposed areas. The nonhardened paint areas are removed by a solvent and hand rubbing. The resultant product resembles a scribed negative.

**PHOTOMORPHIC IMAGE** - A system component used in classification of land which combines airphoto information such as drainage density, photographic texture, settlement patterns and density of structures.

**PHOTOMOSAIC** - See MOSAIC.

**PHOTOTHEODOLITE** - An instrument combining the function of theodolite and camera, used in terrestrial photogrammetry.

**PHOTOTOPOGRAPHY** - 1) (USGS) Mapping in which topographic detail is obtained by photogrammetric methods. 2) (DOD) Mapping in which detail is plotted entirely from photographs at suitable ground stations.

**PHOTOTRIANGULATION** - The process for the extension of horizontal and (or) vertical control whereby the measurements of angles and (or) distances on overlapping photographs are related into a spatial solution using the perspective principles of the photographs. Generally, but not always, this process involves the use of aerial photographs and is called aerotriangulation.

**PHOTOTRIG** - A procedure for determining elevations trigonometrically wherein horizontal distances are determined photogrammetrically and vertical angles are either measured instrumentally in the field or are obtained from measurements on terrestrial photographs.

**PHOTOTRIG TRAVERSE** - A vertical angle traverse employing phototrig methods.

**PHOTOTYPE** - The product of a photographic process in which a master copy of a machine-composed lettering is made on film. Positive or negative copies are processed from the master image onto adhesive-backed stripping film. See STICKUP.

**PICTOMAP** - A color reproduction of a standard photomosaic on which the imagery has been converted into interpretable colors and symbols by means of tonal masking techniques.

**PICTURE AND CONTROL POINT** - See preferred PHOTOCONTROL POINT.

**PICTURE POINT CONTROL** - Generally, a survey station identified on a photograph. See preferred term PHOTOCONTROL POINT.

**PIN POINTING** - The process of identifying photoimages by ground comparison which results in thrusting a fine needle through one photograph and identifying the hole on the reverse side. See PHOTOIDENTIFICATION.

**PITCH** - 1) Rotation of an aircraft in a nose up-nose down direction. 2) Rotation of the camera or coordinate system about the Y axis - ( $\Phi$  O).

**PLANE COORDINATES** - In general, coordinates specifying the location of points on a plane. In surveying use, the "*plane*" is usually a projection of the earth's surface such as a developed cone or cylinder.

**PLANE PARALLEL PLATE** - A flat optical element having both surfaces ground flat and precisely parallel.

**PLANE SURVEYING** - A branch of surveying in which the surface of the earth is considered a plane. For small areas, precise results may be obtained with plane-surveying methods, but the accuracy and precision of the results decrease as the area surveyed increases in size.

**PLANETABLE** - A device for plotting survey data directly from field observation. A planetable consists of a drawing board on a tripod with some type of sighting instrument, generally a telescopic alidade, to measure and plot angles graphically.

**PLANETABLE MAP** - A map made by planetable methods. The term includes maps made by complete field mapping on base projections and by field contouring on planimetric bases.

**PLANETABLE SHEET** - See FIELD SHEET.

**PLANIMETER** - A device for measuring small areas by mechanical integration.

**PLANIMETRIC BASE MAP** - A map prepared from aerial photographs by photogrammetric method as a guide or base for contouring. Manmade features as well as water features are shown.

**PLANIMETRIC MAP** - A map which presents only the horizontal positions for the features represented; distinguished from a topographic map by the omission of relief in measurable form. Planimetric maps may show bench marks and/or elevations of significant features.

**PLANIMETRY** - The details of a map shown in plan, generally the culture and water features.

**PLASTIC RELIEF MAP** - A topographic map printed on plastic and vacuum molded to show relative terrain elevations.

**PLATEAU** - An extensive, level or mainly level area of elevated land. See MESA.

**PLATE COORDINATES** - The X and Y coordinates of control points, pass point or other images on a photograph, generally related to the fiducial marks.

**PLATEHOLDER, DIAPOSITIVE** - A frame or holder for the diapositive plate, specifically designed to facilitate the recovery of correct interior orientation of the diapositive in a particular type of photogrammetric plotting instrument.

**PLATEN** - The screen, usually a disk with a reflecting plane surface, on which the projected images are viewed in stereoscopic plotting instruments of the double-projection type. 2) The surface in the exposure chamber of the camera against which the film is held tight at the instant of exposure. This is usually a precise plane surface, but in some cameras it is curved.

**PLATE PERPENDICULAR** - See PHOTOGRAPH PERPENDICULAR.

**PLATFORM** - The vehicle on which a remote sensor is mounted.

**PLAYA** - An area of land, such as a Salt-Marsh or an Alkali Flat, which is temporarily filled with water and becomes a shallow, muddy lake after exceptionally heavy rainfall, or the flooding of a river, but dries up again in hot weather.

**PLAYBACK** - Later transmission of data which was recorded locally at the time of the occurrence.

**PLUMB POINT** - The nadir point in an aerial photograph.

**PLUMMET** - A plumb bob or plumbline.

**PLUS** - A fractional part of 100 feet used in designating a point on a standard survey line at the plus distance from an even station. See STATION.

**POINT** - 1) A position or location in a reference system determined by survey. 2) A headland or pointed land area projecting into a body of water.

**POINTING ERROR** - The sum of the discrepancies (usually small) in direction to a theodolite sighting caused by vision defects, heat waves, eye fatigue, parallax or optical illusion.

**POINT MARKING** - The procedure of designating discrete photographic locations for pass points, tie points, or control stations by physically marking the emulsion of a print, diapositive, or glass-plate negative. When corresponding image points are marked on overlapping photographs, the procedure is referred to as point transferring.

**POINT MARKING AND TRANSFERRING DEVICE** - A precision instrument for physically marking photographic emulsions to establish discrete points on a single photograph or corresponding points on a stereopair. Provision for stereoscopic viewing is either built in or added to enable accurate marking and transferring. See PUG and SNAP MARKER.

**POINT TRANSFERRING** - See POINT MARKING.

**POLARIZED LIGHT** - Light rays which have been modified such that the transverse vibrations are restricted to a single plane.

**POLAR PLANIMETER** - See PLANIMETER.

**POLAR STEREOGRAPHIC PROJECTION** - A stereographic map projection where the point of tangency is at the pole. Meridians appear as radial lines and parallels are concentric circles.

**POLE-ZENITH-STAR** - The astronomical triangle formed on the celestial sphere.

**POLYCONIC PROJECTION** - A map projection having the central geographic meridian represented by a straight line, along which the spacing for lines representing the geographic parallels is proportional to the distances between the parallels; the parallels are represented by arcs of circles which are not concentric, but whose centers lie on the line representing the central meridian, and whose radii are determined by the lengths of the elements of cones which are tangent along the parallels. All meridians except the central one are curved. The projection is neither conformal nor equal area, but it has been widely used for maps of small areas because of the ease with which it can be constructed.

**POLYESTER FILM** - A plastic material (such as polyethylene terephthalate) of high dimensional stability, widely used as a supporting base in aerial films, map manuscripts, and color-separation drawings.

**PORRO-KOPPE PRINCIPLE** - The system for elimination of known camera lens distortion by observing the photograph (or projecting it) using a lens with the same distortions as the camera.

**PORRO PRISM** - A prism that deviates a ray of light 180° - essentially two 90° prisms cemented together.

**POSITION** - 1) Data which define the location of a point with respect to a reference system. 2) The place occupied by a point on the surface of the earth. 3) The coordinates which define the location of a point on the geoid or ellipsoid. 4) A prescribed setting (reading) of the horizontal circle of a direction theodolite which is to be used for the observation on the initial station of a series of stations to be observed.

**POSITION=AZIMUTH DETERMINATION SYSTEM** - Military designation for inertial positioning and azimuth reference now termed the Auto Surveyor.

**PRAIRIES** - 1) The gently undulating, almost flat, generally treeless, grassy plains. 2) Open, grassy areas as small as 160 acres within forested regions of the northwest USA.

**PRECISION** - (USC & GS) Degree of refinement in the performance of an operation or in the statement of a result. Precision relates to the quality of execution, and is distinguished from accuracy which relates to the quality of the result. The term precision not only applies to the fidelity with which required operations are performed, but by custom has been applied to methods and instruments employed in obtaining results of a high order of accuracy. Precision is exemplified by the number of decimal places to which a computation is carried and a result stated. In a general way, the accuracy of a result should determine the precision of its expression. Precision is of no significance unless accuracy is also obtained. See ACCURACY.

**PRELIMINARY EDITION (USGS)** - A map printed and distributed for temporary use with the proviso that it will later be superseded.

**PRELIMINARY SURVEY** - Collection of data in the field as a basis of studies on a proposed project.

**PRESSPLATE (USGS)** - A thin metal plate containing a printable image processed from a color-separation drawing.

**PRESSURE PLATE** - A flat glass plate used for holding film in a plane position by pressing the film against another flat surface. See PLATEN.

**PRIMARY STATION** See MAIN-SCHEME STATION.

**PRIME VERTICAL** - The vertical circle whose plane is perpendicular to the plane of the celestial meridian. The two intersections of the prime vertical with the horizon are the east and west points.

**PRINCIPAL DISTANCE** - The perpendicular distance from the internal perspective center of a photographic system to the plane of a particular finished negative or print.

**PRINCIPAL LINE** - The trace of the principal plane on the aerial photograph. It is normal to the axis of tilt and passes through both the nadir and the principal point.

**PRINCIPAL PLANE** - The vertical plane containing the photograph perpendicular of a tilted photograph.

**PRINCIPAL POINT** - 1) The foot of the perpendicular from the internal perspective center to the plane of the photograph. 2) Intersection with the earth's surface of a line which is an extension of the optical axis of a return beam vidicon camera. This point differs from the format center by the boresight angle error from a nominal alignment.

**PRINCIPAL STATION** - See MAIN SCHEME STATION.

**PRINT** - A reproduction of another photograph, a map, a drawing, or other subject material. See CONTACT PRINT, PROJECTION PRINT and RATIO PRINT.

**PRINTER** - A device for producing reproductions. See DIAPOSITIVE PRINTER, CONTACT PRINTER and PROJECTION PRINTER.

**PRINT FILM** - Sensitized emulsion on transparent base manufactured for the special purpose of printing photographs, particularly color photographs.

**PRINTING PLATE** - A plate from which impressions are taken in a printing press. See PRESS PLATE.

**PROBABLE ERROR** - There is a 50-50 chance that any measurement will have an error less than the probable error. The probable error equals 0.6745 times the standard error. See STANDARD ERROR and ROOT MEAN SQUARE ERROR.

**PROCESS CAMERA** - See COPYING CAMERA.

**PROFILE** - A vertical section of the surface of the ground or underlying strata along any fixed line.

**PROFILE LEVELING** - The determination of elevations at selected points along an alignment for construction or map accuracy testing.

**PROFILING** - See PROFILE LEVELING.

**PROJECTION DISTANCE** - The distance from the external node of a projection lens to the plane onto which the image is projected.

**PROJECTION PRINT** - A photographic print made by projecting the imagery of a transparency onto a sensitized surface.

**PROJECTION PRINTER** - A precision diapositive printer in which a lens is placed between the negative and diapositive plate to produce a scale-changed diapositive. For some projection printers, the nominal printing ratio is expressed by the ratio of the nominal focal length of the camera (in millimeters) to the principal distance of the stereoplotter to be used (also in millimeters). Other projection printers, designated as "*universal*" are capable of producing diapositives in a wide range of printing ratios (i.e., from various camera focal lengths to a variety of stereoplotter principal distances).

**PROJECTION TABLES** - Mathematical values used for plotting various map projections.

**PROJECTOR** - An instrument by which an image can be projected onto a viewing surface.

**PROJECTOR, REFLECTING** - An instrument by means of which the image of an aerial photograph can be projected onto a map. By varying the position of the projector lens, the scale of the projected image can be varied, and, by tilting the table top, compensation can be made for any tilt in the photograph.

**PROMONTORY** - A headland; a cliff or crag projecting into the sea.

**PSEUDOSCOPIC IMAGE (Pronounced Soodoscopic)** - The apparent reversal of relief.

**PSYCHROMETER** - An instrument for measuring relative humidity of the atmosphere. It consists of two similar thermometers, the bulb of one being kept wet. Air is forced past the thermometers by means of a spring-wound or battery-driven fan motor or by hand whirling.

**PUBLICATION SCALE** - The scale at which a map is intended to be published.

**PUGGING** - See preferred term POINT MARKING.

**PUG POINT-TRANSFER DEVICE** - A brand of point transfer device having a binocular stereoscopic viewing system and a pair of mechanical drills for making holes of specified sizes in the emulsion.

**PULL UP** - A tracing of selected map detail with line weights and symbol sizes suitable for clarity when reduced to the scale of the map under revision.

## Q

**QUADRANGLE** - A four-sided figure, bounded by parallels of latitude and meridians of longitude, used as an area unit in mapping. The dimensions are not necessarily the same in both directions.

**QUADRANGLE MAP** - A map of a quadrangle. See STANDARD QUADRANGLE MAP.

**QUADRANGLE REPORT (USGS)** - A brief history of the mapping of a specific quadrangle. It is assembled in a folder beginning with the specification sheet. It accompanies the mapping material through each phase of production (basic control surveys, supplemental control surveys, photogrammetric compilation, field interpretation and completion, and map finishing) and is filed with the map material. The narrative summary for each operational phase stresses conditions that may affect later phases.

**QUADRIBRACH** - The four armed base of a survey instrument which carries opposed leveling screws.

**QUADRIPOD** - A four-legged stand for support of an observing platform, signals, etc.

**QUANTIZING** - The process by which each grey-tone in a digitized image is assigned a different value according to a mathematical model.

## R

**REV** - Return Beam Vidicon.

**RF** - Representative Fraction.